

## **REMARKS**

Claims 1, 4-13, 15, 18-27 and 46-50 are pending. Claims 1, 4-13, 15, 18-27 and 46-50 have been rejected. Claims 1, 15 and 46 have been amended. Claims 10, 13, 24, and 27 have been additionally cancelled. No new matter has been added. Accordingly, claims 1, 4-9, 11-13, 15, 18-23, 25-26, and 46-50 remain pending for examination.

In this Amendment, Applicant has amended claims 1, 15 and 46 and additionally cancelled claims 10, 13, 24, and 27 from further consideration in this application. Applicant is not conceding that the subject matter encompassed by claims 1, 10, 13, 15, 24, 27 and 46, prior to this Amendment is not patentable over the art cited by the Examiner. Claims 1, 15 and 46 were amended and claims 10, 13, 24, and 27 were additionally cancelled in this Amendment solely to facilitate expeditious prosecution of the allowable subject matter noted by the Examiner. Applicant respectfully reserves the right to pursue claims, including the subject matter encompassed by claims 1, 10, 13, 15, 24, 27 and 46, as presented prior to this Amendment and additional claims in one or more continuing applications.

### **Specification Objection**

Examiner has objected to the Specification as requiring antecedent basis for “computer readable medium.” Applicant believes such is well understood but has amended the Specification to provide the basis requested by Examiner, without adding new matter, and to move prosecution to issuance. Accordingly, Applicant believes the objection should now be withdrawn.

**Amended Claim 1**

Claim 1 has been amended to include Claims 10 and 13, now cancelled.

Claim 1, as amended, recites:

“ A structure for representing a query statement having an atomic query element and a combined query element related by a combined operator, the atomic query element being a noniterative query element, the combined query element including a left subelement and a right subelement, the structure being stored on a computer readable medium, the structure comprising:

an abstract superclass, wherein an instance of the abstract super class represents the query statement and includes an operation on a combination of the combined operator, the atomic query element, and the combined query element, the superclass further comprising:

a first subclass, wherein an instance of the first subclass represents the atomic query element;

a second subclass, wherein an instance of the second subclass represents the combined query element including the left subelement and the right subelement, and wherein each of the left subelement and the right subelement are representable by an instance of the first subclass or the second subclass of the abstract superclass; and

a relationship indicator representing a relationship between the first subclass and the second subclass as defined by the combined operator;

means for receiving the query statement having the atomic query element and the combined query element associated by the combined operator;

means for populating the structure respectively with instances of the abstract superclass, the first subclass, and the second subclass that represent the received query statement;

means responsive to selection of a given instance populated within the structure, for retrieving query elements represented by the given instance; and,

means for building a query statement from the retrieved query elements.”

Applicant believes claim 1, and all claims depending variously therefrom, now stand ready for allowance as each is patentably distinct over Examiner's cited references.

**Amended Claim 15**

Claim 15 has been amended to include Claims 24 and 27, now cancelled.

Claim 15, as amended, recites:

"A method for hierarchically representing a query statement having an atomic query element and a combined query element related by a combined operator, the atomic query element being a noniterative query element, the combined query element including a left subelement and a right subelement, the method comprising:

defining an abstract superclass, wherein an instance of the abstract super class represents the query element and includes an operation on a combination of the combined operator, the atomic query element, and the combined query element;

defining a first subclass of the abstract superclass, wherein an instance of the first subclass represents the atomic query element;

defining a second subclass of the abstract superclass, wherein an instance of the second subclass represents the combined query element including the left subelement and the right subelement, and wherein each of the left subelement and the right subelement are representable by an instance of the first subclass or the second subclass of the abstract superclass;

indicating a relationship between the first subclass and the second subclass defined by the combined operator;

receiving the query statement having the atomic query element and the combined query element associated by the combined operator;

populating a statement structure with instances of the abstract superclass, the first subclass, and the second subclass that represent the received query statement;

retrieving query elements represented by a given instance in response to a selection of the given instance populated within the statement structure;  
building a query statement from the retrieved query elements; and  
storing each of the abstract superclass, the first subclass, and the second subclass on a computer-readable medium.”

Applicant believes claim 15, and all claims depending variously therefrom, now stand ready for allowance as each is patentably distinct over Examiner’s cited references.

**Amended Claim 46**

Claim 46 has been amended and now recites:

“A computer readable medium encoded with a computer program for representing a query statement having an atomic query element and a combined query element related by a combined operator, the atomic query element being a noniterative query element, the combined query element including a left subelement and a right subelement, the computer program comprising computer executable instructions for:

defining an abstract superclass, wherein an instance of the abstract super class represents the query element and includes an operation on a combination of the combined operator, the atomic query element, and the combined query element;

defining a first subclass of the abstract superclass, wherein an instance of the first subclass represents the atomic query element;

defining a second subclass of the abstract superclass, wherein an instance of the second subclass represents the combined query element including the left subelement and the right subelement, and wherein each of the left subelement and the right subelement are representable by an instance of the first subclass or the second subclass of the abstract superclass; and

indicating a relationship between the first subclass and the second subclass defined by the combined operator;

receiving the query statement having the atomic query element and the combined query element associated by the combined operator;

populating a statement structure with instances of the abstract superclass, the first subclass, and the second subclass that represent the received query statement;

retrieving query elements represented by a given instance in response to a selection of the given instance populated within the statement structure; and,

building a query statement from the retrieved query elements.”

Applicant believes claim 46, and all claims depending variously therefrom, now stand ready for allowance as each is patentably distinct over Examiner’s cited references.

### **Claim Rejections – 35 USC 103**

The Examiner states, “Claims 1, 4-13, 15, 18-27, and 26-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graham Spencer (Spencer hereinafter) (US 5,577,251) in view of Witkowski et al. (hereinafter Witkowski) (US Patent No. 6,775,662 B1).” Applicant believes the rejection with respect to cancelled claims is moot, and respectfully disagrees with the rejection for pending claims for the reasons following.

#### **Spencer in view of Witkowski does not render obvious the Present Invention**

Spencer discloses a query architecture based on an abstract **base** class approach retrieving records from a database via iterative searches, whereby specific subclasses are derived from the base class (Abstract). A parser is used to parse a search query into

components and a node creator returns pointers to created query nodes for combining multiple query models.

Examiner has stated that Spencer does “not explicitly disclose that such instance of the first subclass represents the atomic query element.” Applicant agrees, and further notes that Spencer is devoid of such disclosure as Spencer is devoid of a “method for hierarchically representing a query statement having an atomic query element and a combined query element related by a combined operator.”

However, Examiner then sets forth mixed messages in the rejection by first stating the above failure to disclose (OA page 4) by Spencer and then indicating at OA page 10 that Spencer discloses “having an atomic query element (Col 3 lines 50-57, Spencer).” Applicant has reviewed the cited portion and notes that Spencer states:

“The query architecture is extensible because new query models can be implemented by creating new query object subclasses from the QueryNode base class, and providing them with a complementary scoring function. For each new query node class, a new search operator is also created and stored in association with a NodeCreator class object for instantiating an object from the new class whenever the search operator is used.”

Clearly, Spencer does not disclose an atomic query element, nor abstract superclass, nor other elements of the present invention.

Witkowski discloses a system for **rewriting queries** so that they may reference other queries thereby omitting certain groups. (Abstract). In particular, queries that include an outer query that references the result set of an aggregate query are rewritten so that the set of groupings specified by the aggregate query omit groupings that only produce rows that cannot satisfy predicates of the outer query. Thus, when an inner query is computed, only rows for

groupings that could possibly satisfy the predicates of the outer query are generated (col. 5, ll. 48-57).

FIG. 5 of Witkowski illustrates an example predicate tree 501 that is generated for filtering the criteria (or predicates) of a referencing (outer) query (col. 10, ll. 57-58). The predicate tree is used for generating qualifying patterns that describe qualifying groupings – i.e., those groupings that could possibly satisfy the predicates of the outer query (col. 10, ll. 12-19). The qualifying patterns are represented as bitmaps within Witkowski's system (col. 9, ll. 35-38).

Although Witkowski discloses use of a predicate tree in determining groupings that could possibly satisfy the predicates of the outer query, Witkowski fails to disclose a “method for hierarchically representing a query statement having an atomic query element and a combined query element related by a combined operator,” or an abstract superclass wherein an instance of the abstract super class represents the query element and includes an operation on a combination of the combined operator, the atomic query element, and the combined query element. Despite Examiner's submitted rejection of Witkowski's item 511 of FIG. 5 as disclosing a superclass, Applicant asserts that item 511 corresponds only to operator between expressions of a predicate, and does not represent a query statement having an atomic query element and a combined query element related by a combined operator.

Clearly, neither Spencer, nor Witkowski, either alone or when combined, disclose the present invention.

Further, Witkowski fails to disclose how the predicate tree 501 is represented within Witkowski's system. That is, Witkowski is silent as to how a query is represented within

Witkowski's system. Nor is it inherent that a query be represented by an instance of an abstract superclass. See MPEP 2163.07 - "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

Accordingly, as claims 1, 15 and 46 are contextually similar, Applicant asserts that claims 1, 15 and 46, as amended, are allowable and all claims depending therefrom are also allowable, for at least these reasons.

**Spencer in view of Witkowski does not render obvious the Present Invention, as Amended**

However, in order to move prosecution to issuance, Applicant has further amended claim 15 to include the limitations of Claims 24 and 27.

Applicant has amended claims 15 to further include:

    "...receiving the query statement having the atomic query element and the combined query element associated by the combined operator;  
         populating a statement structure with instances of the abstract superclass, the first subclass, and the second subclass that represent the received query statement;  
         retrieving query elements represented by a given instance in response to a selection of the given instance populated within the statement structure;  
         building a query statement from the retrieved query elements; and  
         storing each of the abstract superclass, the first subclass, and the second subclass on a computer-readable medium..."



Applicant asserts that Examiner's basis for rejection of Claims 24 and 27, is misplaced for the reasons following.

Examiner has rejected claim 24 stating that the Spencer Abstract, Col 3 lines 50-57, Fig. 2 items 201.x and 203.x, Col. 6 lines 16-22 and Figure 4 Col 10 lines 57-58 and items 410, 420, 430 and 440 of Witkowski, disclose such. Applicants respectfully disagree.

In the Abstract, Spencer sets forth:

"An information retrieval system incorporates an extensible query architecture allowing an applications programmer to integrate new query models into the system as desired. The query architecture is based on an abstract base class of query nodes, or code objects that retrieve records from the database. Specific subclasses for particular query models are derived from the base class. Each query node class includes a search function that iteratively searches the database for matching records. Query node objects are instantiated by associated node creator class objects. A parser is used to parse a search query into its components, including nested search queries used to combine various query models. The parser determines the particular search operator keywords, and the node creator object for instantiating the appropriate query node object for each search operator. The node creator objects return pointers to the created query nodes, allowing the parser to assemble complex hierarchical query nodes that combine multiple query models."

At Col 3 lines 50-57, Spencer sets forth:

"The query architecture is extensible because new query models can be implemented by creating new query object subclasses from the QueryNode base class, and providing them with a complementary scoring function. For each new query node class, a new search operator is also created and stored in association with a NodeCreator class object for instantiating an object from the new class whenever the search operator is used."

At Col. 6 lines 16-22, Spencer sets forth:

"Because the QueryNode 203 class is an abstract class, it provides the basis of the extensible query architecture by allowing the applications programmer to implement new query models specifically designed to meet the search needs of the user, or the database environment by deriving new NodeCreator 201 .x and QueryNode 203.x classes from the respective base classes."

At Col. 10 lines 57-58, Witkowski sets forth:

“A predicate tree for the filtering criteria of a node is a node graph with leaf nodes and parent nodes.”

Clearly, as is evident from the above cited portions, the references are insufficient in view of the rejection as neither Spencer nor Witkowski, alone or in combination, disclose populating the structure with instances of the abstract superclass; populating the structure with instances of the first subclass, and populating the structure with instances of the the second subclass; that represent the received query statement, as in the present invention.

Accordingly, as claims 10 and 24 were contextually similar, Applicant asserts that basis of claim 10 is allowable as amended with claim 1 and 46 for at least the reasons above. Therefore, Applicant believes, claims 1, 15 and 46, as amended, are allowable and all claims depending therefrom are also allowable.

Examiner has also rejected claim 27 based on Spencer at Col 4, lines 44-53, 58-64, and Witkowski Col. 12, lines 8-9.

At Col. 4 lines 44-53 and 58-64, Spencer sets forth:

“In order to provide an interface to the user for using the information retrieval system 100, the search query manager 103 is coupled to the input device 105 and the display 107, and accepts a search query input by a user with the input device 105. The input search query is eventually processed by the processor 101 to apply it to the databases 121 stored in the mass storage devices 111, either locally, or on the network 119. Any results for the search query are returned to the search query manager 103 for outputting on the display 107.”

“The search operators may include keywords for creating boolean queries, such as "AND," "OR," "NOT," keywords such as "DATE" and "TIME" for retrieving documents having particular creation or modification dates or times, and keywords such as "HASWORD" (or conventionally the absence of any keyword) for retrieving documents having particular words.”

At Col. 12 lines 8-9, Witkowski sets forth:

“At step 136, query QPQ is rewritten to QPQRW, as follows.”

Clearly, as is evident from the above cited portions, the references are limited as Spencer provides an input device for providing a search query while Witkowski sets forth a rewriting step sequence. Neither Spencer nor Witkowski, alone or in combination, disclose the present invention and the feature of: “retrieving query elements represented by a given instance in response to a selection of the given instance populated within the structure; and building a query statement from the retrieved query elements.”

Accordingly, as claims 13 and 27 were contextually similar, Applicant asserts that basis of claim 13 is allowable as amended with claim 1 and 46 for at least the reasons above. Therefore, Applicant believes, claims 1, 15 and 46, as amended, are allowable and all claims depending therefrom are also allowable.

**The claim, as amended has limitations not taught by either reference**

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

Spencer and Witowski fail to disclose a structure that includes an abstract superclass, in which an instance of the abstract super class represents a query statement having an atomic

query element and a combined query element related by a combined operator. Further, neither reference, alone or in combination, discloses a method in which "...populating the structure with instances of the abstract superclass, the first subclass, and the second subclass that represent the received query statement; retrieving query elements represented by a given instance in response to a selection of the given instance populated within the structure; building a query statement from the retrieved query elements."

Accordingly, Applicant asserts that the combination of Spencer and Witkowski cannot render the present invention, as claimed, obvious.

For at least these reasons, Applicant submits that claims 1, 15 and 46, and the claims that depend variously therefrom, are in condition for allowance.

**CONCLUSION**

Applicant therefore respectfully requests reconsideration, allowance and passage to issue of the claims as now presented. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,  
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